

-Keynote Speech II-

Scalable Reinforcement Learning for Engineering Applications

Dr. Varuna De Silva

Institute for Digital Technologies
Loughborough University London

Abstract. Explainability and generalizability are two key demands placed upon any method of Artificial Intelligence for success in the real-world. Furthermore, there is a growing demand for distributed intelligent systems that could coordinate decisions. Reinforcement learning is a branch of Artificial Intelligence with a goal to develop intelligent agents by utilizing trial-and-error techniques. This talk will focus on recent developments in reinforcement learning research that aim to address the challenges of explainability and generalizability by leveraging the advances in neuro-symbolic learning, deep learning and variational inference on probabilistic graphical models. Recent developments in multi-agent reinforcement learning and their engineering applications will also be introduced. Importantly, the talk will discuss various techniques such as curriculum learning, evolutionary methods, and hybrid simulation and data driven methods to scale reinforcement learning research towards application in safety-critical, data-constrained Engineering applications.

Dr. Varuna De Silva is a Senior Lecturer in Machine Intelligence at Loughborough University. He obtained his Ph.D. in video coding and communications from Center for Vision Speech and Signal Processing at University of Surrey in 2011. He has worked in 3 major European Union Funded Projects during 2010-2013. Between 2013 and 2016, Varuna worked as a senior research engineer in computer vision at Apical Ltd (Now part of ARM UK). He currently supervises 7 PhDs and 2 Post-doctoral research fellows in the area of Artificial Intelligence (Multimodal machine learning and multi-agent reinforcement learning) with a strong focus on engineering applications in driverless vehicle technology and team sport analytics.